UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,198	02/26/2002	Eyal Krupka	10559-654001/P13018	8485

			EXAMINER
20985	7590	10/17/2006	AGHDAM, FRESHTEH N

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ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/086,198	KRUPKA, EYAL
	Examiner	Art Unit	
	Freshteh N. Aghdam	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2006*.

2a)☒ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 8/18/2006 have been fully considered but they are

not persuasive.

Applicant's Argument(s):   On pages 8-10, applicant argues that the claimed

invention is not taught or suggested by Baier "determining the parameters of the

parameterized channel tap model by fitting the one or more sets of adaptively updated

channel taps to a continuous function of time."

Response to argument(s): Baier teaches that determining the discrete

parameters of the parameterized channel tap model by fitting the one or more sets of

adaptively updated channel taps to be as close as possible to the continuous function of

time (i.e. real) (Fig. 2 and 4; Col. 6, Lines 30-40). Moreover, one of ordinary skill in the

art would clearly recognize the advantages of signal processing digitally over signal

processing in analog domain (i.e. continuous of function of time). Since when the

channel impulse response model is continuous (i.e. analog), one would be required to

use a signal processor with a huge amount of memory since the amount of computation

would be very high (infinite). But at the same time, there is a trade off between the

hardware complexity reduction (discrete) and accuracy of the system (continuous).

Therefore, in practice, in order to reduce the hardware complexity and the amount of

computation that should be performed even at the cost of reducing accuracy, a discrete

model of channel taps is employed over the continuous one.

Claim Rejections - 35 USC § 101

Claims 1-9, 10-19, and 20-27 are rejected as being under 35 U.S.C. 101

because: as to independent claims 1, 10, and 20, the claimed invention is directed to a

non-statutory subject matter because as a whole it does not accomplish a practical

application. In order to accomplish a practical application, it must produce a: useful,

concrete and tangible result." (see Interim Guidelines for Examination of Patent

Applications for Patent Subject Matter Eligibility, pages 21-22) In other words, the

tangible requirement does require that the claim must recite more than a 101 judicial

exception. It is for the discovery or invention of some practical method or means of

producing a beneficial result or effect, that a patent is granted see Corning, 56 U.S. (15

How.) at 268, 14 L.Ed. 683. Applicant in claims 1, 10, and 20, recites a method,

however, there is no tangible result disclosed for this method.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

Claims 1-9, 10-19, and 20-27 provides for the use of "the one or more sets of

channel taps to estimate one or more symbols in a received data stream", but, since the

claim does not set forth any steps involved in the method/process, it is unclear what

method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 1-27 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 6-8, 10, 15-17, 19, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baier (US 5,185,764).

As to claims 1, 10, and 19, Baier teaches initializing the parameters of a continuous (i.e. time dependent or time varying) channel tap model (Fig. 2, means 28; Col. 4, Lines 15-18); calculating one or more sets of channel taps from the channel tap model (Fig. 2, means 28 and 31); using the one or more sets of channel taps to estimate one or more symbols in a received data stream (Fig. 2, means 29); calculating one or more sets of adaptively updated channel taps from the one or more symbols

estimated in the received data stream (Fig. 2, means 29 and 31); and fitting the one or

more sets of adaptively updated channel taps to a continuous function of time (i.e. to be

as close as possible to the real channel tap model) see (Fig. 2, means 28, 29, and 31;

Col. 4, Lines 26-47; Col. 6, Lines 58-68; Col. 7, Lines 1-11).Baier is silent about the

channel tap model is a continuous function of time. However, one of ordinary skill in the

art would clearly recognize the advantages of signal processing digitally over signal

processing in analog domain (i.e. continuous of function of time). Since when the

channel impulse response model is continuous (i.e. analog), one would be required to

use a signal processor with a huge amount of memory since the amount of computation

would be very high (infinite). But at the same time, there is a trade off between the

hardware complexity reduction (discrete) and accuracy of the system (continuous).

Therefore, in practice, in order to reduce the hardware complexity and the amount of

computation that should be performed even at the cost of reducing accuracy, a discrete

model of channel taps is employed over the continuous one.

As to claims 2, 11, and 20, Baire teaches obtaining a set of channel taps from an

input data stream containing a training data stream and a locally generated copy of the

training data stream; and initializing the parameters of the channel tap model with the

first set of channel taps (Fig. 2; Col. 6, Lines 58-68; Col. 7, Lines 1-11).

As to claims 6, 15, and 24, Baier teaches iteratively determining the parameters

of the channel tap model; and initializing the parameters determined in a previous

iteration by fitting the one or more sets of adaptively updated channel taps determined

in the previous iteration (Fig. 2, means 28, 29, and 31; Col. 6, Lines 58-68; Col. 7, Lines 1-11).

As to claims 7, 16, and 25, Baier teaches using the channel tap model to estimate progressively larger numbers of symbols in subsequent iterations of the method (Col. 4, Lines 23-26).

As to claims 8, 17, and 26, Baier teaches terminating the iterative method until a predetermined condition has been met (Col. 5, Lines 36-40).

Claims 3, 12, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baier, and further in view of Belotserkovsky et al (US 2002/0021750).

As to claims 3, 12, and 21, Baier teaches all the subject matters claimed above, except for running an LMS algorithm to calculate the one or more sets of adaptively updated channel taps from the one or more estimated symbols. Belotserkovsky teaches using an LMS algorithm for tap adaptation (Par. 28). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Belotserkovsky with Baier in order to perform channel tap adaptation by taking into the account no probabilistic assumption (signal model).

Claims 4-5, 13-14, and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baier, and further in view of Moreland et al (US 5,790,598).

As to claims 4-5, 13-14, and 22-23, Baier teaches all the subject matter claimed above, except for fitting the one or more sets of adaptively updated channel taps to a channel tap model that is linear in time. Moreland teaches an adaptive equalizer in a receiver that uses a channel tap model that is linear in time (Col. 12, Lines 11-65).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the

teaching of Moreland with Baier in order to reduce the intersymbol interference and at

the same time simplifying the computations (i.e. the computation of channel tap model

is simpler when it is assumed to be linear in time).

Contact Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Freshteh N. Aghdam whose telephone number is (571)

272-6037. The examiner can normally be reached on Monday through Friday 9:00-

5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Freshteh Aghdam   **KEVIN BURD**
October 6, 2006   **PRIMARY EXAMINER**